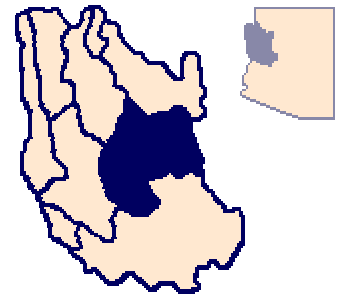


BIG SANDY BASIN

The Big Sandy basin consists of approximately 1,900 square miles in northwest Arizona (Figure 13). It is bounded by the Hualapai Mountains to the west, the Mohon Mountains to the south, the Juniper Mountains to the east, and the Peacock Mountains and Cottonwood Cliffs to the north. The Aquarius Mountains run north-south and divide the Basin and Range province to the west from the Central Highlands province to the east. Land surface elevations in the mountainous areas range from 5,000 feet above mean sea level in the Aquarius Mountains in the central part of the basin to a maximum altitude of 8,417 feet above mean sea level at Hualapai Peak in the Hualapai Mountains to the west.



Groundwater occurs in three hydrologic settings: in the floodplain alluvium and upper basin-fill found along the central valley, and in the sedimentary rocks found in the extreme northeastern part of the area.

The floodplain alluvium generally is 30 to 40 feet thick. This unit is an unconsolidated deposit of gravel and sand that underlies the streams and floodplains. Wells greater than 40 feet deep that tap the stream and floodplain alluvium along the Big Sandy River near Wikieup also tap the upper basin-fill. These wells, if properly constructed, can yield as much as 1,000 gallons per minute. As of 1980, there had been no significant changes in water level in the unconsolidated deposits.

Most of the groundwater development has been along the central valley where one of the main water-bearing units is the upper basin-fill. These deposits vary from a loosely-consolidated silty gravel to a sandy silt. The thickness of the upper basin-fill is estimated at 150 to 200 feet in the northern part of the area and about 300 feet near Wikieup and Natural Corrales Wash. The upper basin-fill receives recharge from streamflow during most of the year. It is estimated that the upper basin-fill is capable of yielding as much as 1,000 gallons per minute of water to wells (Davidson, 1973).

In the east-northeast portion of the Big Sandy basin, a sedimentary layer composed of the Redwall Limestone and the Martin Formation (Arizona Bureau of Mines, 1958) may be a regional aquifer which extends to adjacent areas to the north and the east (Cady, 1981). In the area of the Big Sandy basin where this unit is present, the depths to water range from 32 feet below land surface in the east near Buck Dam to a reported 950 feet below land surface in the northern part of the basin, just south of Rubel Ranch. There are very few wells in this area, therefore, the areal extent of the aquifer cannot be determined.

The Hackberry area, in the north-northeast portion of the basin, is experiencing long-term declines of 1 to 2.5 feet per year (Gillespie and Bentley, 1971; Remick, 1981).

The dissolved-solids concentrations in the Big Sandy basin range from 282 milligrams per liter (mg/l) in the basin-fill southwest of the Peacock Mountains to 2,460 mg/l in Antelope Wash, northeast of the Hualapai Mountains. Fluoride concentrations in this area range from 0.2 mg/l in the Mohon Mountains to 20.0 mg/l along the edge of the basin-fill, east of Hualapai Peak. Overall, the quality of the groundwater in the Big Sandy basin is good, however, the groundwater in much of the area contains fluoride in amounts greater than the maximum contaminant level of 1.4 mg/l. The groundwater in the Big Sandy basin is suitable for irrigation use because it is not highly mineralized and the sodium concentrations generally are smaller than those of calcium and magnesium (Davidson, 1973).

In the past, the primary use of groundwater has been for agriculture, however, since the early 1970's, groundwater pumped in the Big Sandy area primarily has been used for mining. In 1980, approximately 2,000 acre-feet of groundwater were withdrawn and roughly 95 percent of that water was transported by pipeline to the Bill Williams basin for use in mining operations.